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ABSTRACT

This study aims to identify students' achievement goal orientations, learning strategies they use and the relationship between goal orientations and learning strategies. The sample included 189 students taking an educational psychology course at the undergraduate level. They filled out a questionnaire on goal orientations and learning strategies. Results indicate that the students are very close to mastery orientation and somewhat ego-social as a whole. Students use deep cognitive strategies often while they use surface and metacognitive strategies sometimes. Mastery orientation predicts the use of deep cognitive and metacognitive strategies, but when such an orientation is salient, less surface cognitive strategy use is expected. Ego- social orientation predicts surface cognitive strategy use, but does not relate to deep and metacognitive strategy use at all. Finally, work-avoidant orientation negatively correlated with both deep cognitive and metacognitive strategy use. (Contains 7 tables and 40 references.) (SLD)

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ED 423 287

RELATIONSHIP BETWEEN ACHIEVEMENT GOAL ORIENTATIONS AND USE OF LEARNING STRATEGIES

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ABSTRACT

This study aims to identify students' achievement goal orientations, learning strategies they use and the relationship between goal orientations and learning strategies. The sample included 189 students taking Educational Psychology course at the undergraduate level and they filled out a questionnaire on goal orientations and learning strategies. The results indicate that the students are very close to mastery orientation and somewhat ego-social as a whole. Students use deep cognitive strategies often while they use surface and metacognitive strategies sometimes. Mastery orientation predicts the use of deep cognitive and metacognitive strategies, but when such an orientation is salient, less surface cognitive strategy use is expected. Ego-social orientation predicts surface cognitive strategy use, but does not relate to deep and metacognitive strategy use at all. Finally, work-avoidant orientation negatively correlates with both deep cognitive and metacognitive strategy use.

Introduction

Theories of motivation, more specifically achievement motivation, in their quest for an understanding of background reasons for human endeavor and behavior, attempt to explain factors mediating students' autonomous learning behavior. Rothstein (1990) and Woolfolk (1990) in their definitions of motivation highlight it as a driving force for students' learning goals, the activities they choose to engage in to reach those goals, and the intensity with which they engage in these activities. In this respect, content- specific motivational characteristics, i.e. locus of control type, self-efficacy beliefs, and value-judgments in a specific course, practically shaped by the specific learning climate, are expected to mediate the achievement goal orientations students would adopt, and the learning behaviors they would exert (Feather, 1961; 1963; McClelland, 1987; Meece et al., 1988; Rothstein, 1990; Schiefele, 1991; Weiner, 1974; Woolfolk, 1990).

Different researchers labeled different sets of contrasting achievement goal orientations: learning versus performance (Elliot & Dweck, 1988; Miller et al., 1993), task versus ego (Fox et al., 1994), deep, achieving, and surface approaches to achievement (Ainley, 1993), mastery versus performance (Ames & Archer, 1988; Cho, 1992), task-mastery, ego-social, and work-avoidant (Meece et al., 1988; Meece & Holt, 1993; Nolen & Haladyna, 1990), knowledge-building, instructional, and task-completion (Ng & Bereiter, 1991). The common rationale and criteria in defining these sets of contrasting achievement goal orientations is related to whether the approach or orientation perceives and values learning as an end in itself or as a tool for some other external goals.

Among these frameworks, the one put forward by Meece et al. (1988), namely mastery, ego-social, and work-avoidant, can be considered as inclusive of others. In mastery orientation, achievement is represented as mastery and understanding with an emphasis on self-development. On the other hand, in ego-social orientation, emphasis on getting high grades and outperforming others prevail to gain social approval and to enhance ego. Finally, in the work-avoidant orientation, failure is avoided against hard work, so achievement is represented as completing a task putting in as little effort as possible.

On the other hand, the idea of self-regulated learning, brought forth by the demands of the dynamic nature of the knowledge systems typical of our time, deems learning a life-long act and the learner an active participant in teaching-learning processes. Within this context, promoting students' independence or autonomy by equipping them with the tools, tactics, and skills for learning to learn is supposed to hopefully enable them to orchestrate their own life-long learning act more effectively. This active participation of the learner in the learning processes implies "learning to learn" with learner's increased initiative and control on his own learning acts--his self-regulation--supported and enhanced by the tools he uses in learning--learning strategies (Apps, 1990; Loranger, 1994; Weinstein & MacDonald, 1986). Thus,

learning strategies, globally defined as "...mental processes that learners can deliberately recruit to help themselves learn and understand something new..." by Resnick (cited in Brandt, 1988/1989, p.12), are regarded as essentials of self-regulated or autonomous learning.

The literature presents different taxonomies to define and classify learning strategies (Dansereau et al., 1983; Pintrich & Garcia, 1991; Weinstein & MacDonald, 1986; Weinstein & Mayer, 1986). However, common to most of these definitions and classifications is the division of learning strategies into two broad domains: cognitive strategies and metacognitive strategies. Cognitive strategies, basically consisting of rehearsal, elaboration, and organization, help students encode new information as well as organize and retrieve it. On the other hand, metacognitive strategies, basically consisting of planning, monitoring, and regulating, help one control and execute their learning processes (Gall et al., 1990; Pintrich, 1988). Furthermore, cognitive strategies are classified into two as surface cognitive strategies, referring to rehearsal (repetition, reciting, highlighting, etc.), which help encoding new information into short-term memory only, and deep cognitive strategies, referring to elaboration and organization, which facilitate long-term retention of the target information (Pintrich & Garcia, 1991; Nolen & Haladyna, 1990; Nolen, 1988; Graham & Golan, 1991).

Experimental research studies, mostly proposing intervention models, have demonstrated the positive effect of training the underachiever and the disabled students, as well as average successful students, in using learning strategies effectively on helping them overcome their learning problems, and on enhancing the degree and quality of their learning (Benton, 1992; Deshler & Schumaker, 1986; Lenz, 1992; Losh, 1991; Nuttal, 1992; Paris et al., 1984; Ramos-Cancel, 1991; Rose & Winne, 1993; Vauras et al., 1994; Zimmerman & Pons, 1986). Similarly, Gilbert (1984) presupposed that it was possible to overcome learners' capacity limitations through training them on metacognitive strategies. Yet, as expressed by Weinstein et al. (1989), for strategy training not to turn into mere mechanical competency training, it is crucial to provide learners with a repertoire of various learning strategies and training them on which to use in various circumstances with the involvement of critical thinking processes. This new understanding of learning strategy use, emphasizing teaching students when to use which most effectively, is the product of a more holistic perception of learning looking into "whys" of learning as well as "hows". In this respect, achievement goal orientations could therefore help explain "whys" of the intensity of students' cognitive engagement in learning in terms of learning strategy use.

It should be noted that students' achievement goal orientations and learning strategy use are learning context specific rather than general traits. Ames and Archer (1988) argue that situational demands are the initiating factors that shape students' individual perceptions which in turn form up adoption of different goal orientations, and goal orientations finally leads into variance in students' use of learning strategies.

Although the literature presents many studies on learning strategies and goal orientations, only a few investigate the relations among these two components (Ainley, 1993; Graham & Golan, 1991; Nolen & Haladyna, 1990; Meece et al., 1988; Pintrich & Garcia, 1991). Therefore, this study, in an attempt to answer the basic question why not all students do actually use learning strategies effectively, or why some do not go beyond basic rehearsing, which is typical of surface processing, focuses on any presumable relationship between students' achievement goal orientations and their strategy use in a specific course. Specifically, this study attempts to answer the research questions below:

1. What are students' achievement goal orientations?

2. To what degree do students use different types of learning strategies?

3. Is there a significant relationship between students' achievement goal orientations and their use of learning strategies?

Method

Data Collection Instrument

In order to investigate students' use of different types of learning strategies in relation to their achievement goal orientations, a three-part survey questionnaire was developed. The first section included questions on background variables, ranging from demographic characteristics to interests and beliefs; the second section on students' achievement goal orientations, and the third section on the learning strategies they use. The statements measuring achievement goal orientations and learning strategies used in a specific course, Educational Psychology, were written based on an extensive review of relevant literature.

The section on the achievement goal orientations included statements corresponding to the three orientation subscales depicted from the literature--mastery, ego-social, and work-avoidant. Items in the mastery subscale (a total of 13) included statements on studying or reading for personal development, trying to comprehend the course content as much as possible, perceiving the assignments and exams as challenges, perceiving achievement as acquisition of new skills, and learning from errors. Items in the ego-social subscale (a total of 13) included statements on perceiving achievement as getting high grades to outperform others, perceiving high grades as certification of competence, perceiving assignments and exams as opportunity to get high grades, trying to be active in the class activities to impress the teacher, and avoiding making errors. Items in the work-avoidant subscale (a total of 8) included statements on perceiving achievement as not failing, comprehending the course content only enough to pass, perceiving the assignments as extra work that needs to be avoided, and putting in as little effort as possible to pass the course.

The section on learning strategies the students use included statements exploring three types of learning strategies; *surface cognitive* (referring to rehearsal, i.e. highlighting,

underlining, copying, repeating items in a list, which activate short-term memory only), *deep cognitive* (referring to elaboration, i.e. paraphrasing, summarizing, creating analogies, and generative note-taking, which help integrating new information with the already existing knowledge in long-term memory, and organization, i.e. selecting main ideas, outlining, networking, and diagramming, which help analyzing the information in a text in terms of the interrelations among ideas and transferring this information into different modes of representation), and *metacognitive* (referring to planning, i.e. setting goals, skimming, and generating questions, which constitute a pro-active basis that help organization and comprehension, monitoring, i.e. monitoring thinking, comprehension and academic behavior, which help looking out any weaknesses or failures in attention or comprehension, and regulating, i.e. adjusting reading rate, re-reading, and reviewing, which help adjusting or modifying cognition where necessary).

In the sections of the questionnaire where achievement goal orientations were measured, the students were asked to respond to each statement on a 5-point Likert scale ranging from "not at all true of me" to "very true of me." On the other hand, for learning strategy use, a five-point Likert scale ranging from "never" to "very often" was used.

A pilot study was carried out with a group of 47 students taking an introductory psychology course in the Fall Semester in 1995. The items that did not work in terms of clarity and applicability were eliminated. The reliability of the items measuring achievement goal orientations and learning strategy use was assessed by an internal consistency measure. Alpha scores were calculated for each subscale in both sections. For the goal orientations, a .85 alpha score on mastery, a .83 alpha score on ego-social, and a .79 alpha score on work-avoidant scales were found. For learning strategy use, a .81 alpha score on surface cognitive, a .84 alpha score on deep cognitive, and a .77 alpha score on metacognitive strategy scales were obtained, indicating a relatively high consistency among the items in each subscale.

Sample

The sample of this study consisted of the students who were taking the Educational Psychology course at Middle East Technical University in Turkey in the Spring Semester in 1996. These students represented different departments including Educational Sciences, Physics Education, Foreign Language Education, Chemistry Education, Biology Education, Mathematics Education, and Physical Education.

In the sample selection, the aim was to reach students within a specific course so that they would respond to the questionnaires from that point of view. The rationale behind selecting a specific course for which to elicit students' responses was the implications drawn from the relevant literature reviewed. Students' achievement goal orientations are sensitive to differences in course content and the learning context. In other terms, students' motivation and learning strategies are contextualized and situation-specific; they could not be treated as

generalized individual differences. So, students' use of different learning strategies, assumed to be dependent on their orientations and background characteristics, is also regarded as situation-specific (Pintrich & Garcia, 1991).

The total number of students taking this course at the university during the Spring Semester in 1996 was 314; however, 125 students could not be reached or chose not to complete the questionnaire. Consequently, a total number of 189 subjects were included in the study. The distribution of students in terms of their departments ranged from 3.3% to 41.2%, the largest being Foreign Language Education Department (41.2%). Second year students (79.9%), and females (66.7%) formed the majority. A considerable number of students live at university dormitory (41.3%), and find their study place very appropriate (50.3%). The students having a GPA score between 2.01 and 3.00 out of 4.00 are represented by the largest percentage (58.8%). Most of the students have a high interest in the course (62.4%), and find the course useful for their future professional life (79.9%). Most of the respondents (70.4%) find their instructor effective, and have a high level of attendance in the lessons (70.9%).

Data Analysis Procedures

The results of the questionnaire were analyzed through descriptive and inferential statistics. First, descriptive analysis of all questionnaire items in terms of percentages and means were carried out. Second, subscale scores were calculated for each of the three achievement goal orientations and the mean differences between these orientation scores were analyzed through a MANOVA test. Third based on the scores in each orientation, respondents were clustered, and as a result a total of eight orientation profiles were found. Fourth, subscale scores were calculated for the three types of learning strategies and the mean differences between these learning strategy scores were analyzed through a MANOVA test. Finally, the relationship between the achievement goal orientations and the use of learning strategies was analyzed through a correlation coefficient test.

Results

Achievement Goal Orientations

As indicated above, achievement goal orientation mean scores were calculated based on the students' responses to the statements in each orientation subscale. The results show that the students in the sample are closer to mastery orientation than the other two orientations (see Table 1). The sample scored a mean of 3.88 responding to the mastery orientation subscale items. On the other hand, the group can also be characterized as somewhat ego-social, since the mean score obtained on their responses to the ego-social orientation subscale is 2.53. Finally, very little work-avoidance is reflected in the group's responses, with their

1.98 mean score. Nevertheless, the sample is more ego-social oriented than work-avoidant oriented. According to a Hotellings T^2 test, the differences among the mean scores obtained for the three subscales are significant at .001 level.

Table 1
Mean and Standard Deviation Scores for Mastery, Ego-social, and Work-Avoidant Subscales

	MEAN	SD	N
Mastery orientation	3.88	.83	189
Ego-social orientation	2.53	.80	189
Work-avoidant orientation	1.98	.77	189

T^2=79.96, p=.000
Mean scores are based on a five-point Likert scale where 1=not at all true of me, 2=very little true of me, 3=somewhat true of me, 4=almost true of me, 5=very true of me.

In order to get a clearer description of the students constituting the sample in terms of their achievement goal orientations, possible orientation profiles were identified amongst the whole sample using a method similar to that of Ames and Archer (1988). When students' mastery, ego-social, and work-avoidant subscale scores are divided into high and low values, eight achievement goal orientation profiles are generated. As Table 2 indicates, about three-fifths of the respondents surveyed have a score of 3.0 or higher on mastery scale but 2.9 or lower on the other two scales, reflecting a clear mastery orientation. Of the other respondents, 20.1% score 3.0 or higher on both mastery and ego-social subscales, but 2.9 or lower on work-avoidant subscale, indicating a mixed mastery and ego-social orientation to achievement. The students who could be considered having a clear ego-social orientation, since they score 3.0 or higher on ego-social subscale but 2.9 or lower on both mastery and work-avoidant subscales, are represented by only 3.2% of the sample. Similarly, only 4.2% score 3.0 or higher on work-avoidant subscale, but 2.9 or lower on both mastery and ego-social subscales. The percentage of the respondents who score 3.0 or higher on both ego-social and work-avoidant orientations but 2.9 or lower on mastery orientation to achievement is only 1.6%. Furthermore, only 2.1% score 3.0 or higher on all three subscales, and again 2.1% score 3.0 or higher on both mastery and work-avoidant subscales but 2.9 or lower on ego-social subscale. Finally, 3.7 score 2.9 or lower on all three subscales.

These results suggest that only a clear mastery orientation and a mixture of mastery and ego-social orientations are predominant among the respondents, while a clear mastery orientation is much more dominant than the other (N=119 and N=38 respectively). On the other hand, the students who could be regarded as having a clear ego-social or a clear work-avoidant orientation are of a very small minority of the whole sample. The facts that a clear mastery orientation is the most dominant, and a clear work-avoidance is almost non-existent

among the sample could be attributed to the nature of the sample and the university, the students being university students and the university being one of the most prestigious in Turkey. Furthermore, the fact that ego-social orientation tends to go with mastery and that a very narrow clear ego-social orientation profile exists can also be related to this situation.

The students scoring 3.0 or higher on all three subscales, 2.9 or lower again on all three subscales, and 3.0 or higher on both mastery and work-avoidant but 2.9 or lower on ego-social subscale were eliminated from the data file for further analysis since their responses were considered as inconsistent according to the theoretical framework of this study. As a result, the sample for further analysis changed from 189 into 174.

Table 2
Distribution of the Achievement Goal Orientation Profiles

		Frequency	Percent
Group 1	high mastery (3.0+) low ego-social (2.9-) low work-avoidant (2.9-)	119	63
Group 2	high mastery (3.0+) high ego-social (3.0+) low work-avoidant (2.9-)	38	20.1
Group 3	low mastery (2.9-) high ego-social (3.0+) low work-avoidant (2.9-)	6	3.2
Group 4	low mastery (2.9-) low ego-social (2.9-) high work-avoidant (3.0+)	8	4.2
Group 5	low mastery (2.9-) high ego-social (3.0+) high work-avoidant (3.0+)	3	1.6
Group 6	high mastery (3.0+) high ego-social (3.0+) high work-avoidant (3.0+)	4	2.1
Group 7	high mastery (3.0+) low ego-social (2.9-) high work-avoidant (3.0+)	4	2.1
Group 8	low mastery (2.9-) low ego-social (2.9-) low work-avoidant (2.9-)	7	3.7
		N = 189	

The students in groups 6, 7 and 8 are discarded in the further data analysis; therefore N changed into 174.

Types of Learning Strategies Used

As indicated in the method section, respondents' use of learning strategies at surface cognitive, deep cognitive and metacognitive levels were measured through items written

according to the basic characteristics of each of these three levels. Responses to seven statements measuring surface level strategy use are presented in Table 3. Students report that they use "highlighting" strategy more often than other strategies (M=4.37). Overall they say they use "re-reading" and "memorizing key words" strategies sometimes to often (M=3.61 and M=3.44 respectively). Other surface strategies, namely "memorizing lists" (M=2.85), "reciting" M=2.79), "copying information from the readings" (M=2.77), and "memorizing most of the content" (M=2.60) are used only sometimes or less and respectively.

Table 3
Respondents' Use of Surface Cognitive Strategies (in percentages and means)

Statements	1	2	3	4	5	MEAN	N
While reading for this course, I often underline the parts that I think important.	2.9	6.3	5.2	21.8	63.8	4.37	174
While studying for this course, I read my class notes and the course readings over and over again, so I will remember them.	6.3	14.4	23.6	23.6	32.2	3.61	174
While studying for this course, I try to memorize the key words related to the important concepts.	13.9	11.0	20.8	26.0	28.3	3.44	173
While studying for this course, I make a list of important items and memorize the list.	25.4	20.8	17.3	16.2	20.2	2.85	173
While studying for this course, I practice saying the class notes and the readings to myself over and over, so I will remember them.	27.6	22.4	12.1	19.5	18.4	2.79	174
While studying for this course, I copy the information directly from the readings to my notebook, so I learn everything as it is.	23.6	24.7	19.0	16.7	16.1	2.77	174
While studying for this course, I try to memorize everything that might be asked in the exam.	31.2	19.7	19.1	18.5	11.6	2.60	173

Mean scores are based on a five-point Likert scale where 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often. N's for each item vary due to missing responses, and items in the table are listed in order of means.

To measure deep cognitive strategy use, students were asked to respond to 11 statements. As Table 4 indicates, students use the majority of the deep cognitive strategies often while they use others sometimes. They use "making analogy between the readings and the concepts from the lectures" strategy often (M=4.28). In addition, the strategies of "relating the material to what is already known from other resources" (M=4.14), "writing brief summaries of the main ideas and concepts from the reading and lectures" (M= 3.96), "pulling together information from lectures and readings" (M=3.90), "distinguishing main ideas and supporting ideas" (M= 3.80), "relating information to other courses" (M=3.79), and finally "breaking text into parts to identify relations among them" (M=3.50) are used often. On the other hand students use the remaining deep cognitive strategies listed in the table

sometimes: "going over classnotes and making outlines" (M=3.27), "using ideas from readings in class activities" (M=3.18), "outlining material" (M=2.93), and finally "organizing information from all notes and readings" (M=2.93).

Table 4
Respondents' Use of Deep Cognitive Strategies (in percentages and means)

Statements	1	2	3	4	5	MEAN	N
While studying for this course, I try to make connections between the readings and the concepts from the lectures in order to comprehend the course content as a whole.	4.0	2.9	8.7	29.5	54.9	4.28	173
While studying for this course, I try to relate the material to what I already know from other sources.	3.4	5.2	12.1	32.2	47.1	4.14	174
While studying for this course, I write brief summaries of the main ideas and concepts from the readings and the lectures.	7.5	7.5	10.9	29.9	44.3	3.96	174
While studying for this course I pull together information from lectures and the readings that I have done on my own to understand the content as a whole.	4.1	10.5	15.1	32.0	38.4	3.90	172
While reading for this course, I try to distinguish main and supporting ideas.	4.0	12.1	17.3	32.4	34.1	3.80	173
While studying for this course, I try to relate ideas or information in this course to those in the other courses whenever possible.	6.4	8.7	22.0	26.0	37.0	3.79	173
While reading for this course, I break the text into parts according to the basic ideas and try to identify the relationship among the parts.	8.1	15.0	22.5	29.5	24.9	3.50	173
While studying for this course, I go over my class notes and make an outline of important concepts and ideas.	13.3	14.4	24.3	28.3	19.7	3.27	173
I try to apply ideas from course readings in other class activities such as lecture and discussion.	16.1	18.4	20.1	22.4	23.0	3.18	174
While reading for this course, I outline the material to help me organize my thoughts.	19.5	22.4	21.8	17.8	18.4	2.93	174
While studying for this course, I organize the information from all my class notes and the readings into simple charts, diagrams, or tables.	22.0	20.2	19.1	20.2	18.5	2.93	173

Mean scores are based on a five-point Likert scale where 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often. N's for each item vary due to missing responses, and items in the table are listed in order of means.

Next, the students were asked to respond to 10 statements measuring their use of metacognitive learning strategies. As Table 5 presents, students use "re-reading to sort out something that creates confusion" and "trying to determine the concepts they don't understand well most often" (M=3.94 and M=3.90 respectively). In addition, they also often use "adapting studying to the course and instructor's style" (M=3.68), "compensating missing notes with other resources" (M=3.68) and "skimming material before reading it" (M=3.57). On the other hand, "self-questioning" (M=3.33), "adapting reading to the material"

(M=3.28), "thinking about the topic critically" (M=3.04), and "setting goals for self to direct studying" (M=2.86) are used sometimes. Finally, "generating questions to guide reading" is the least often used (M=1.88) metacognitive strategy.

Table 5
Respondents' Use of Metacognitive Strategies (in percentages and means)

Statements	1	2	3	4	5	MEAN	N
While studying for this course, if I become confused about something I read, I go back to my previous notes and sort it out.	5.8	11.0	12.1	26.0	45.1	3.94	173
While studying for this course, I try to determine which concepts I don't understand well.	6.3	5.7	17.2	32.2	38.5	3.90	174
In this course, I try to determine the way I study according to the course requirements and the instructor's teaching style.	7.5	10.4	20.8	28.9	32.4	3.68	173
In this course, if I can't take notes in class, I make sure I learn the bit I missed from other sources or from my classmates.	15.5	10.3	9.8	19.5	44.8	3.68	174
In this course, before I start reading a material thoroughly, I often skim it to see how it is organized.	9.8	12.1	17.9	31.8	28.3	3.57	173
While reading for this course, I ask myself questions to make sure I understand the material.	9.8	19.0	20.7	29.9	20.7	3.33	174
While reading for this course, if I find it difficult to understand the material, I change the way I read it.	10.9	17.8	23.0	28.7	19.5	3.28	174
While reading for this course, I try to think through a topic and decide what I am supposed to learn from it, rather than just reading it over.	14.4	23.0	22.4	24.7	15.5	3.04	174
While studying for this course, I set goals for myself in order to direct my activities in each study period.	23.6	21.8	18.4	17.2	19.0	2.86	174
Before starting to read for this course, I come up with questions about the topic to focus my reading.	48.3	28.7	12.6	7.5	2.9	1.88	174

Mean scores are based on a five-point Likert scale where 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often. N's for each item vary due to missing responses, and items in the table are listed in order of means.

As the mean scores in Table 6 indicate, overall, the students use deep cognitive strategies more than other surface cognitive and metacognitive strategies. While the students use deep cognitive strategies often (M=3.62), they use surface cognitive and metacognitive strategies sometimes. The extent to which the students use surface cognitive strategies is almost the same as the extent to which they use metacognitive strategies (M=3.20 and M=3.22 respectively).

Table 6
Mean and Standard Deviation Scores for Surface Cognitive, Deep Cognitive, and Metacognitive Subscales

	MEAN	SD	N
Surface cognitive	3.20	.93	174
Deep cognitive	3.62	.77	174
Metacognitive	3.22	.64	174

T^2=35.981, p=.000
Mean scores are based on a five-point Likert scale where 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often.

Relationship Between Achievement Goal Orientations and Type of Learning Strategies Used

As discussed in the section on achievement goal orientations, among the eight orientation profiles drawn up, the students in the sample mostly fall into clear mastery orientation (N=119) and in a mixed mastery/ego-social orientation (N=38) profile. A minority of students showed the characteristics of a clear work-avoidant orientation (N=8) and of a combination of ego-social and work-avoidant (N=3) orientations.

Finally, 15 students either scored high or low in all three orientations or high in both mastery and work-avoidant orientations. These cases were difficult to explain since their responses seemed contradictory based on the theoretical framework of the study. Therefore, these cases were eliminated from further analysis, and a correlation coefficient test was carried out with the remaining 174 students to examine the correlation between students' responses to the achievement goal orientations and the learning strategies.

The results of the test presented in Table 4 indicate that, although it is not very high, there is a significant negative correlation between mastery orientation and using surface cognitive strategies (-.24), whereas mastery orientation is positively correlated with both deep cognitive and metacognitive strategy use (.63 and .53 respectively). On the other hand, ego-social orientation is found positively correlated with the use of surface cognitive strategies (.40), yet not correlated with the use of either deep or metacognitive strategies (-.04 and -.02 respectively). Work-avoidance is positively correlated with using surface cognitive strategies, though not very highly (.27). However, work-avoidance is negatively correlated with both deep cognitive (-.45) and metacognitive (-.40) strategy uses.

Furthermore, amongst the three achievement orientations, ego-social orientation scores the highest positive correlation with surface cognitive strategy use. On the contrary, mastery orientation scores the only negative correlation with it. Besides, both deep cognitive and metacognitive strategy uses display the only positive correlation with mastery orientation, moreover at very high significance levels. Conversely, deep cognitive and metacognitive strategy uses are negatively correlated with only work-avoidant orientation.

Table 7
Relationship Between Achievement Goal Orientations and Types of Learning Strategies Used

Orientations	Learning Strategies		
	Surface cognitive	Deep cognitive	Metacognitive
Mastery	-.24 (N=174) P=.001	.63 (N=174) P=.000	.53 (N=174) P=.000
Ego-Social	.40 (N=174) P=.000	-.04 (N=174 P=.638	-.02 (N=174) P=.785
Work-Avoidant	.27 (N=174) P=.000	-.45 (N=174) P=.000	-.40 (N=174) P=.000

It could be inferred from these findings that mastery orientation leads into preference for using deeper, more meaningful, and more self-regulatory behaviors and processings compared to the other two orientations. In addition, it could be interpreted that the higher the work-avoidance is the more such learning behaviors and processings are avoided. Interestingly, for ego-social orientation, its only noteworthy correlation is found with surface cognitive strategies, which indicates that the more such an orientation is highlighted the higher the preference for short-term and rote learning behaviors is.

Discussion

The responses to the questionnaire indicate that the sample included in this study is as a whole very close to mastery orientation and somewhat ego-social. There are basically two orientation profiles dominant among the sample: the students are either clearly mastery-oriented or both mastery- and ego-social oriented, while the former is at a higher degree than the latter. However, there are only a few students who fall into the clear work-avoidant and clear ego-social profiles. That a large number of students tend to mix the mastery and the ego-social orientations in their achievement goals is plausible since they live in a culture where social approval of success is traditionally very important.

The finding that ego-social orientation tends to go with mastery might indicate that the perception of achieving as outperforming others, and learning as a means to gain social approval to enhance ego is not a trend on its own, yet, still not non-existent for the students high in both mastery and ego-social orientations. For such students, the justification might be that learning for self-development is well appreciated but it should also be marked or documented by high grades as a confirmation of their being on the right track. On the other hand, for clear mastery-oriented students, the right track is already known: the inherent pleasure of learning and improving knowledge and skills, which are the criteria of their achievement.

Regarding the overall use of surface cognitive, deep cognitive, and metacognitive strategies, the responses of the students indicate that although the students use the surface and metacognitive strategies to similar extends, deep cognitive strategy use is more dominant than the other two. This might suggest that being university students, the sample have got the awareness of the importance of meaningful processings, and have got considerably developed thinking skills to use superficial cognitive processes to a lesser degree than deeper cognitive processes; however, still have not got the same level of awareness in cognition about cognition.

Regarding the relationship between achievement goal orientations and the use of three types of learning strategies, mastery orientation predicts the use of more deep cognitive and metacognitive strategies, but when such an orientation is salient, less surface cognitive strategy use is expected, as Nolen and Haladyna (1990), Ainley (1993), and Meece et al. (1988) had found. In this context it could be concluded that valuing learning as an end in itself and perceiving achievement as the development of skills or acquisition of new knowledge lead into increased preference for meaningful and autonomous learning processes, but decreased superficial processings. Next, ego-social orientation predicts surface cognitive strategy use, but does not relate to deep and metacognitive strategy use at all, which is in line with the findings of Nolen and Haladyna (1990). Then, it could be inferred that perceiving achievement as getting high grades to outperform others and as documenting self-ability, which in return is expected to enhance ego, and considering learning as a tool, in this respect, bring about increased preference for superficial processings during learning.

On the basis of these findings, concerning the mediation between these two achievement goal orientations and the learning strategy use, we could suggest, when mastery orientation is prominent, students have got a more realistic attitude to learning. More specifically, their awareness of the effective learning behaviors and their own performance in juxtaposition to such behaviors, along with their critical thinking skills, are more alert; therefore they indulge in meaningful and autonomous learning more. On the contrary, when ego-social orientation is prominent, the heavy desire to satisfy or enhance ego may block the student from getting into involving in such awareness or practices.

Finally, work-avoidant orientation negatively correlates with both deep cognitive and metacognitive strategy use. In other words, the more the work-avoidance is, the less involvement in meaningful and autonomous learning is expected, in line with Meece et al. (1988). This is natural, taking into consideration that the salient goal in work-avoidance is getting work done putting in as minimal effort as possible.

Studying the relationship between goal orientations and learning strategies is important from several perspectives. First, why some students use effective learning strategies while others do not has traditionally been an important question in schools. This study offers some explanations in terms of the influence of goal orientations on the use of

certain types of learning strategies. Second, this study demonstrates that the theoretical framework about the goal orientations may not explain the students as clearly as in the literature. Students' orientations may combine several dimensions of the goal orientations even though it seems theoretically inconsistent in the literature. Finally, the conclusions on the type of learning strategies used imply that students use of metacognitive strategies still need to be elevated to a higher degree. This could be achieved by a greater emphasis on self-study or self-regulated activities in courses, which could also incorporate in detailed orientation programs to raise students' awareness on planning, self-testing, and flexible adjusting of strategies in accordance with course or task requirements.

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